DOE/ID-11017 *Revision 0* *January 2005*

Idaho National Engineering and Environmental Laboratory

Explanation of Significant Differences

Explanation of Significant Differences for the Record of Decision for the Power Burst Facility and Auxiliary Reactor Area Operable Unit 5-12

At the Idaho National Engineering and Environmental Laboratory
Idaho Falls, Idaho

DOE/ID-11017
Revision 0
Project No. 23366

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January 2005

Prepared for the
U.S. Department of Energy
DOE Idaho Operations Office

Signature sheet for the *Explanation of Significant Differences to the Record of Decision for the Power Burst Facility and Auxiliary Reactor Area Operable Unit 5-12* at the Idaho National Engineering and Environmental Laboratory, between the U.S. Department of Energy and the U.S. Environmental Protection Agency, with concurrence by the Idaho Department of Environmental Quality.

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U.S. Environmental Protection Agency

1-5-05
Date

Signature sheet for the *Explanation of Significant Differences to the Record of Decision for the Power Burst Facility and Auxiliary Reactor Area Operable Unit 5-12* at the Idaho National Engineering and Environmental Laboratory, between the U.S. Department of Energy and the U.S. Environmental Protection Agency, with concurrence by the Idaho Department of Environmental Quality.

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12/20/04
Date

Signature sheet for the *Explanation of Significant Differences to the Record of Decision for the Power Burst Facility and Auxiliary Reactor Area Operable Unit 5-12* at the Idaho National Engineering and Environmental Laboratory, between the U.S. Department of Energy and the U.S. Environmental Protection Agency, with concurrence by the Idaho Department of Environmental Quality.

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12/17/2004
Date

ABSTRACT

This explanation of significant differences, which applies to the *Record of Decision Power Burst Facility and Auxiliary Reactor Area*, documents a significant difference in the remedy selected in the record of decision for treatment of the waste contained in the ARA-16 radionuclide tank. The remedy selected in the record of decision for the ARA-16 tank waste was removal, ex situ thermal treatment, and disposal. This explanation of significant differences alters the remedy for the ARA-16 tank waste to allow an alternative approach to treat this waste. Specifically, the waste will be included with the Test Area North V-Tanks waste for treatment in the system being developed for that much larger waste stream. Both the ARA-16 and the V-Tanks remedial actions are being performed pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA/Superfund) and the "National Oil and Hazardous Substances Pollution Contingency Plan." This change is needed, because the thermal treatment options identified in the record of decision will not be available, and no other thermal treatment facility can accept the ARA-16 sludge.

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ACRONYMS

AMWTF	Advanced Mixed Waste Treatment Facility
ARA	Auxiliary Reactor Area
ARAR	applicable or relevant and appropriate requirement
ATG	Allied Technology Group
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DEQ	Idaho Department of Environmental Quality
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
EPA	U.S. Environmental Protection Agency
ESD	explanation of significant differences
FR	Federal Register
ICDF	INEEL CERCLA Disposal Facility
INEEL	Idaho National Engineering and Environmental Laboratory
LDR	land disposal restriction
NA	not applicable
OU	operable unit
PBF	Power Burst Facility
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
ROD	record of decision
RWMC	Radioactive Waste Management Complex
TRU	transuranic
TSCA	Toxic Substances Control Act
USC	United States Code
VOC	volatile organic compound
WAG	waste area group

Explanation of Significant Differences for the Record of Decision for the Power Burst Facility and Auxiliary Reactor Area Operable Unit 5-12

1. INTRODUCTION

This explanation of significant differences (ESD) applies to the *Record of Decision Power Burst Facility and Auxiliary Reactor Area* (DOE-ID 2000) that was signed in January 2000 by the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA) Region 10, and the Idaho Department of Health and Welfare—which is now the Idaho Department of Environmental Quality (DEQ)—pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC § 9601 et seq.).

This ESD documents a significant difference in the remedy selected in the record of decision (ROD) (DOE-ID 2000) for treatment of the waste contained in the Auxiliary Reactor Area (ARA)-16 radionuclide tank in accordance with the *Code of Federal Regulations* (CFR), Title 40, Part 300.435(c)(2)(i). In summary, this ESD allows for nonthermal treatment of the sludge and residual liquid waste from the ARA-16 radionuclide tank and revision of applicable or relevant and appropriate requirements (ARARs).

The major components of the selected remedy for the ARA-16 radionuclide tank in the ROD (DOE-ID 2000) included removal of the waste from the tank; treatment of that waste; excavation of the tank and vault; excavation and disposal of soil exceeding the Cs-137 remediation goal; decontamination (to the extent possible), removal, and disposal of associated piping; treatment and disposal of any secondary waste generated during the remedial action; and restoration of the site. This ESD addresses only the treatment of the waste previously removed from the tank.

The alternative consists of combining the ARA-16 tank waste with the V-Tanks waste from Operable Unit (OU) 1-10 and treating the combined waste with air sparging at ambient or slightly elevated temperatures (up to and including boiling) to remove volatile organic compounds (VOCs). If organic land disposal restriction (LDR) treatment standards are not met at this point, the waste will be chemically oxidized/reduced to meet the applicable LDR standards. The treated waste will be solidified/stabilized, as appropriate, and disposed of at the INEEL CERCLA Disposal Facility (ICDF). A concurrent ESD was prepared for OU 1-10 describing and approving this treatment approach (including the addition of this waste stream) (DOE-ID 2004a). This remedy is further described in the remedial deign/remedial action work plan (DOE-ID 2004b) for the V-Tanks. Both the ARA-16 and the V-Tanks remedial actions are being performed in accordance with the requirements in CERCLA and 40 CFR 300, "National Oil and Hazardous Substances Pollution Contingency Plan." Management of polychlorinated biphenyls (PCBs) will be in accordance with EDF-3077, "Risk-Based Approach for Management of PCB Remediation Waste from the V-Tanks," which was approved as part of the OU 1-10 ESD (DOE-ID 2004a).

Section 104(d)(4) of CERCLA (42 USC § 9601 et seq.) allows that where two or more noncontiguous facilities reasonably related on the basis of geography or on the basis of a threat or potential threat to public health, welfare, or the environment, the U.S. president may—in his discretion—treat these related facilities as one for purposes of CERCLA Section 104(d)(4). The preamble to 40 CFR 300 (55 FR 8690) further explains that when noncontiguous facilities (i.e., separate operable units) are reasonably close to one another and/or waste types at these sites are compatible for a selected treatment or disposal approach, CERCLA Section 104(d)(4) allows the lead agency to treat these related facilities as one site for response purposes and, therefore, allows the lead agency to manage waste

transferred between such noncontiguous facilities without having to obtain a permit. The Test Area North treatment facility is designated in the ROD amendment (DOE-ID 2004c) for the treatment of mixed low-level waste from tanks such as the tank waste found at OU 5-12. Therefore, the treatment process at Test Area North and the waste addressed by this ESD are considered to be a single site for the response purposes under this ESD.

The lead agency for remedial action at OU 5-12 is the U.S. Department of Energy Idaho Operations Office (DOE Idaho). The EPA and the DEQ both concur with the need for this significant change to the selected remedy. The three agencies participated jointly in the review of new information and the decision that led to preparation of this ESD.

This ESD will become part of the Idaho National Engineering and Environmental Laboratory (INEEL) administrative record for OU 5-12. The INEEL administrative record is part of the INEEL's information repositories, which are available on the Internet at http://ar.inel.gov/home.html and at the following locations:

INEEL Technical Library
DOE Public Reading Room
1776 Science Center Drive
Idaho Falls, ID 83415
(208) 526-1185
Hours: 8 a.m. to 5 p.m. Monday through Friday, except as posted

Albertsons Library
Boise State University
1910 University Drive
Boise, ID 83725
(208) 385-1621
Hours: 7:30 a.m. to 12 midnight Monday through Thursday; 7:30 a.m. to 8 p.m. Friday; 10 a.m. to 8 p.m. Saturday; 10 a.m. to midnight Sunday, except as posted.

2. SITE HISTORY, CONTAMINATION PROBLEMS, AND SELECTED REMEDY

The INEEL is a 2,305-km^2 (890-mi^2) federal facility operated by the DOE and is located on the northern edge of the Eastern Snake River Plain. The ARA and Power Burst Facility (PBF) are located in the south-central portion of the INEEL north of U.S. Highway 20 (Figure 1). The ARA and PBF were established in the late 1950s to test nuclear reactor concepts and applications.

The ARA was constructed to support the Army Nuclear Program. The ARA has four operational areas, three of which have not been used since the late 1980s and have been decontaminated and dismantled. The ARA-IV facility was decontaminated and dismantled in 1985, and the area is now used occasionally to test explosives.

The PBF was built to conduct nuclear reactor safety experiments and consists of five operational areas. The last reactor was shut down in 1985. The focus at PBF shifted to waste management and reduction activities for the INEEL. Currently, much of the facility has undergone decontamination, decommissioning, and dismantlement, with the remaining buildings being readied for a new mission at the Critical Infrastructure Test Range Complex. The PBF reactor area is currently undergoing decontamination, decommissioning, and dismantlement, with completion of those activities slated for January 2005.

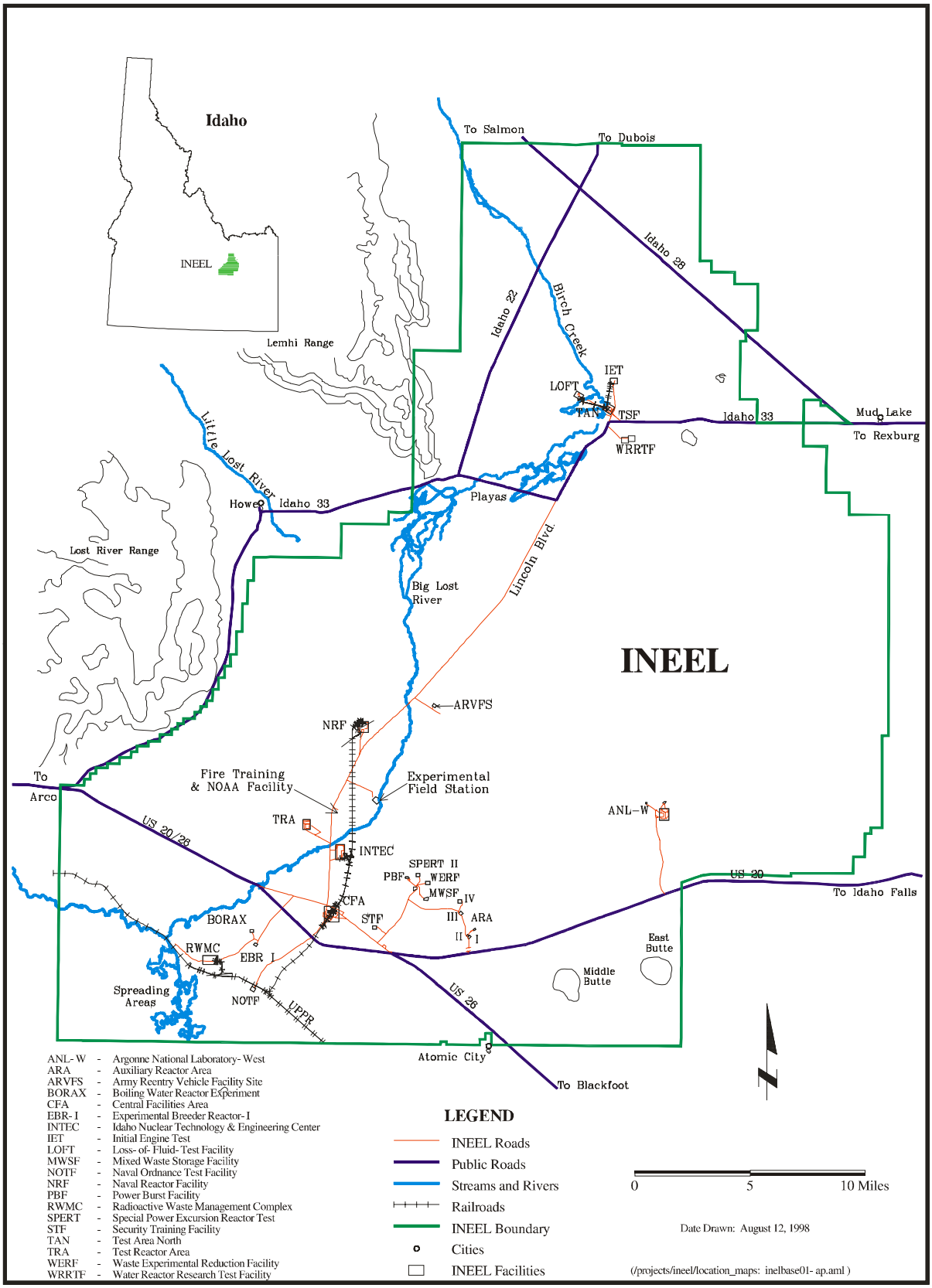

Figure 1. Idaho National Engineering and Environmental Laboratory.

The ARA-16 radionuclide tank, located at the ARA-I facility, consisted of a 3,785-L (1,000-gal) stainless-steel underground holding tank within a lidless concrete vault. The vault was filled with soil, resulting in the tank being covered by 1.1 m (3.5 ft) of soil. From 1959 to 1988, the tank received radioactive and hazardous liquid waste. Periodically, the contents of the tank were transferred into a tank truck and transported to the Idaho Nuclear Technology and Engineering Center (known as the Idaho Chemical Processing Plant at that time) for disposal. In 1988, the tank was partially excavated; all lines into and out of the tank were cut and capped, and the contents were removed, leaving approximately 109 L (28 gal) of residual liquid and sludge in the tank.

Soil sampled and analyzed between the tank and vault and outside of the vault indicated the tank had not leaked. However, the entire area was affected by the windblown contamination from cleanup of the accident at the Stationary Low-Power Reactor No. 1. Cesium-137 in the soil and gravel in and around the tank vault were found to exceed risk thresholds for the 100-year future residential scenario. No releases have occurred from the ARA-16 tank, and the tank did not leak, but its contents were identified as a principal-threat waste and could have posed an unacceptable risk if released to the environment.

The remedy selected in the ROD was removal, ex situ thermal treatment, and disposal. This remedy was to include the following activities:

- Removal of waste from the tank, transfer to a high-integrity container for temporary storage, treatment in a facility approved for Resource Conservation and Recovery Act (RCRA) (42 USC § 6901 et seq.) and Toxic Substances Control Act (TSCA) mixed waste (15 USC § 2601 et seq.), and disposal at the ICDF, the Waste Isolation Pilot Plant, Envirocare, or another approved disposal facility
- Excavation of the tank, vault, and piping
- Decontamination of the tank and associated piping, encapsulation (if required to meet waste acceptance criteria), and disposal at the Radioactive Waste Management Complex (RWMC), the ICDF, or another approved INEEL facility
- Shipment of the vault, gravel, and Cs-137-contaminated soil to the ICDF or another INEEL facility
- Restoration of the site.

The ROD (DOE-ID 2000) specified that for the treatment facility to be acceptable, it must be (1) approved for treatment of RCRA and TSCA mixed waste, (2) capable of treating all of the tank waste to satisfy RCRA LDRs, and (3) able to satisfy TSCA requirements for PCB disposal. Two proposed treatment facilities were identified that could satisfy treatment requirements of the tank waste: (1) the Advanced Mixed Waste Treatment Facility (AMWTF) at the INEEL and (2) the Allied Technology Group, Inc., (ATG) mixed waste treatment facility at Richland, Washington. Both facilities were planning to permit, construct, and operate high-temperature thermal processes to destroy organics, including PCBs, to meet the RCRA LDRs for organics and meet the TSCA PCB disposal criteria.

Remediation of ARA-16 began in 2000, and the tank contents, the tank itself, and associated piping were removed in 2001. After partial in-place decontamination of the piping using high-pressure low-volume spray, the piping was removed and placed in waste boxes. Low-density grout was added to the boxes to completely encapsulate the piping. The waste boxes were then shipped to the Staging and Storage Annex, located at the Idaho Nuclear Technology and Engineering Center, for eventual disposal at the ICDF.

After excavation of the piping, the trenches and stockpiled soil were surveyed for gamma-emitting contaminants. Only one 15-ft-diameter area was found to have detection levels above the 23-pCi/g remedial action goal for Cs-137 in soil. The soil in this hot spot was excavated, segregated from the rest of the soil, and analyzed for contamination. Analytical results demonstrated that Cs-137 was the only contaminant present at levels of concern; therefore, this soil was disposed of at the RWMC.

The liquid and sludge were pumped from the tank into a high-integrity container that was equipped with dewatering internals. The tank was rinsed, and the rinse water was transferred to the high-integrity container. The liquid in the high-integrity container was separated from the sludge using the dewatering internals and pumped through a carbon filter to reduce organic concentrations in the liquid to meet LDRs and the ICDF waste acceptance criteria. The liquid was stabilized using sodium polyacrylate monopolymer and then shipped to the Staging and Storage Annex for eventual disposal at the ICDF.

The high-integrity container containing the ARA-16 radionuclide tank sludge and the carbon filter were placed in an approved, compliant storage unit for TSCA- and RCRA-regulated waste at ARA. The sludge and filter will be stored at this location until treatment becomes available. Initially, it was envisioned that the sludge would be treated at an incinerator previously planned to be built and operated at the AMWTF or the thermal treatment facility to be built by the ATG. However, these options are no longer viable, because plans for construction of the incinerator at the AMWTF were cancelled, and ATG has ceased construction because of financial difficulties leading to bankruptcy proceedings.

3. DESCRIPTION OF SIGNIFICANT DIFFERENCE AND THE BASIS FOR THE DIFFERENCE

This ESD alters the remedy for the ARA-16 sludge that was removed from the tank, allowing an alternative approach to treating the sludge. This alternative is based upon reducing the VOC concentrations through air sparging at ambient or slightly elevated temperatures (up to and including boiling). If organic LDR treatment standards are not met at this point, chemical oxidation/reduction will be used to meet RCRA LDR F001 and F005 standards in accordance with the ARARs set forth in this ESD as well as ICDF or other approved disposal facility waste acceptance criteria. Management of PCBs will be in accordance with EDF-3077, “Risk-Based Approach for Management of PCB Remediation Waste from the V-Tanks,” which was approved as part of the OU 1-10 ESD (DOE-ID 2004a).

This change is needed, because the thermal treatment options identified in the ROD (DOE-ID 2000) will not be available: the AMWTF incinerator was cancelled, ATG ceased construction because of financial difficulties leading to bankruptcy proceedings, and no other thermal treatment facility is available to accept the ARA-16 sludge because of the high radiation dose associated with it. Consequently, the contents of the ARA-16 radionuclide tank have remained in compliant storage at ARA-I since their removal from the tank rather than transporting them to the RWMC to await treatment at either the AMWTF or ATG.

The amended remedy for the ARA-16 radionuclide tank waste is to combine it with the waste from the Waste Area Group (WAG) 1 OU 1-10 V-Tanks and then apply air sparging at ambient or slightly elevated temperatures (up to and including boiling) to remove VOCs. If organic LDR treatment standards are not met at this pont, then chemical oxidation/reduction will be implemented. Once organic treatment standards are met, the liquid waste will be solidified/stabilized as necessary to meet ICDF waste acceptance criteria. This remedy applies processes that provide the relative benefits of contamination control in a relatively low-temperature liquid process. As an alternative to combining the ARA-16 waste with that from the V-Tanks, the possibility exists that the ARA-16 waste may be treated separately under the same treatment approach, but the current plan is to combine the two waste streams for treatment.

The ARA-16 waste stream is approximately 303 L (80 gal), consisting of 17 L (4.5 gal) of sludge and 286 L (75.5 gal) of liquid. The initial radionuclide source-term calculation presented in Table 1 was performed based upon the original as-found concentrations for the sludge and liquid in the ARA-16 radionuclide tank and used the volumes provided in Section 10.7 of the ROD (DOE-ID 2000), which showed that the tank contained 17 L (4.5 gal) of sludge and 1,180 L (312 gal) of liquid. During the removal of the waste from the tank, much of the liquid was separated from the sludge, accounting for the difference in volumes between the original as-found condition and the current state of the waste. Correcting the volumes for density and converting to mass yielded the average and maximum concentrations for the radionuclides. This provided an average transuranic (TRU) concentration of 1.33 nCi/g, with a maximum of 1.58 nCi/g.

Table 1. As-found radionuclide concentrations.

	pCi/g in Tank		nCi/g in Tank	
	Average	Maximum	Average	Maximum
Gamma Isotopes				
Ag-108m	7.84E+01	1.15E+02	7.84E-02	1.15E-01
Co-60	3.45E+03	5.43E+03	3.45E+00	5.43E+00
Cs-134	7.30E+02	8.58E+02	7.30E-01	8.58E-01
Cs-137	2.49E+05	2.85E+05	2.49E+02	2.85E+02
Eu-152	3.63E+02	4.21E+02	3.63E-01	4.21E-01
Eu-154	9.84E+01	1.53E+02	9.84E-02	1.53E-01
Zn-65	9.29E+01	1.11E+02	9.29E-02	1.11E-01
Alpha Isotopes				
Pu-238	3.82E+02	4.86E+02	3.82E-01	4.86E-01
Pu-239/240	3.91E+02	4.75E+02	3.91E-01	4.75E-01
U-234	6.00E+02	6.58E+02	6.00E-01	6.58E-01
U-235	4.63E-03	4.63E-03	4.63E-06	4.63E-06
U-238	7.86E+00	7.86E+00	7.86E-03	7.86E-03
Am-241	5.54E+02	6.17E+02	5.54E-01	6.17E-01
Strontium-90	9.62E+03	1.10E+04	9.62E+00	1.10E+01
Tritium	NA	2.98E+02	NA	2.98E-01
TRU Concentration	—	—	1.33E+00	1.58E+00

As the waste currently resides in the high-integrity container, a second source-term calculation was performed using the exposure rate measured at contact on the container combined with the known maximum sludge contaminant concentrations to determine an inferred concentration of the waste. MicroShield calculations were performed to compute the exposure rate for the sludge from which the contaminant concentrations were determined. This approach was taken because the actual volumes in the container could only be estimated due to its configuration. The inferred concentrations for Pu-238, Pu-239/240, and Am-241 are 11.4 nCi/g, 11.7 nCi/g, and 16.6 nCi/g, respectively, yielding a maximum

TRU concentration of 39.7 nCi/g for the waste in the container as compared to an average TRU concentration of 4.27 nCi/g (DOE-ID 2004c). The Cs-137 and Sr-90 concentrations obtained from the MicroShield calculations are 5,000 nCi/g and 247 nCi/g, respectively, as compared to the average V-Tank concentrations of 988 nCi/g and 1,840 nCi/g, respectively (DOE-ID 2004c). Because short-lived contaminants play a key role in the MicroShield exposure rate calculations, contaminant concentrations were decay-corrected from those presented in the ROD (DOE-ID 2000).

As can be seen from the data, the TRU concentration for the ARA-16 waste as found (1.58 nCi/g maximum) is significantly lower than that determined for the waste as it currently exists in the high-integrity container (39.7 nCi/g). This is attributed to the successful separation and removal of most of the liquid that was in the waste as found in the tank. The as-found TRU concentration of the ARA-16 waste stream is well below the ICDF waste acceptance criterion of 10 nCi/g. Furthermore, once the ARA-16 waste is treated, the final treated waste form will be stabilized in grout to provide shielding, ultimately yielding a final disposal form that is below the 10-nCi/g criterion.

Table 2 provides a comparison of the averaged V-Tanks waste stream to the ARA-16 waste stream for key organic contaminants of concern, including trichloroethene, tetrachloroethene, 1,1,1-trichloroethane, bis (2-ethylhexyl) phthalate, and PCBs (specifically, aroclor-1260). Both the ARA-16 and the V-Tanks waste streams are F001 listed types of waste. As can be seen from the table, similar contaminants are found in both waste streams, although some concentration differences exist. Given the much smaller volume of the ARA-16 waste stream (303 L [80 gal] versus 45,084 L [11,910 gal] for the V-Tanks), the higher concentrations introduced into the treatment system from the ARA-16 waste stream should have a minimal effect on the treatment process.

Table 2. Organic contaminants of concern comparison.

Contaminant	V-Tanks		ARA-16
	Average (mg/kg)	95% Upper Confidence Limit (mg/kg)	Average (mg/kg)
Trichloroethene	426	1,090	1,880
Tetrachloroethene	118	235	3.3
1,1,1-Trichloroethane	52	122	9,210
bis (2-ethylhexyl) phthalate	454	552	751
Polychlorinated biphenyls	18	21	40.9

Initially, air sparging at ambient or slightly elevated temperatures (up to and including boiling) will be used to remove VOC contaminants from the waste stream. If contaminant concentrations are reduced to an acceptable level, no further treatment will be necessary. If contaminant concentrations still exceed the prescribed treatment levels, however, chemical oxidation/reduction will be employed. If chemical oxidation/reduction is used, a chemical oxidant/reductant will be added to the waste to destroy the remaining organic contaminants, including PCBs. The waste will be agitated and maintained at a controlled pH, as necessary, to enhance the chemical oxidation/reduction reaction. If necessary, the reaction will be heated to boiling temperatures to facilitate destruction.

When organic treatment standards have been attained, the waste will be chemically neutralized as necessary, and the resulting waste stream will be transferred and solidified/stabilized with grout or a similar material. The solidified/stabilized waste will be disposed of at the ICDF. The contaminants captured in the off-gas and the filters used in the off-gas system will be disposed of at the ICDF or an approved off-Site facility. A full discussion of the proposed treatment technologies for the contents of the V-Tanks and an evaluation of the alternatives is provided in the OU 1-10 ROD amendment (DOE-ID 2004c). The remedy selected in the OU 1-10 ROD amendment was slightly modified in the OU 1-10 ESD (2004a).

Under this amended remedy, the ARA-16 radionuclide tank contents will be combined with the contents of the V-Tanks followed by treatment to the extent necessary to meet treatment standards in accordance with ARARs; the contents will then be solidified/stabilized in order to meet the waste acceptance criteria for the ICDF (or another approved facility, if necessary). Chemical oxidation/reduction will be required for specific underlying hazardous constituents if the waste is confirmed to exhibit a RCRA characteristic. The WAG 1 project had conducted laboratory studies to optimize the choice of specific oxidant(s)/reductant(s) (e.g., peroxide) and to optimize the treatment process. The treatment process is explained more fully in the V-Tank remedial design/remedial action work plan (DOE-ID 2004b).

Disposal of the carbon filter that has also remained in compliant storage will be accomplished through stabilization by encapsulation followed by direct disposal at an approved facility. The water that was passed through the filter did not contain PCB concentrations that would require PCB destruction. The activated carbon was analyzed and determined to be nondetect for PCBs and thus was not regulated under TSCA. In addition, the water did contain sufficient concentrations of VOCs such that the loading of the carbon would lead to concentrations of 1,1,1-trichloroethane and acetone at levels of 87 and 249 ppm, respectively. However, totals analysis of the activated carbon in accordance with EPA-prescribed methods demonstrated compliance with the F-listed LDR treatment standard applicable to this waste. The analytical results for VOCs were reported as less than detection levels with a reporting limit of 8 µg/kg for both of the analytes of concern. These detection levels were several times lower than the treatment standards for 1,1,1-trichloroethane and acetone of 6 mg/kg and 160 mg/kg, respectively. It is believed that the VOCs are intrinsically bound by the activated carbon, thereby rendering them unavailable for release into the environment. In conclusion, the waste meets the applicable LDR treatment standard and does not present an unacceptable risk to human health or the environment. The prescribed disposal method is appropriate.

3.1 Overall Protection of Human Health and the Environment

The proposed treatment alternative protects human health and the environment, in both the short and long term, from unacceptable risks posed by hazardous substances by eliminating or reducing exposure to levels within the remediation goal. The primary risk associated with the ARA-16 site was to human health and was attributed to external exposure to ionizing radiation from the presence of Cs-137 in the soil surrounding the tank. Dermal absorption and ingestion of PCBs pose secondary human health risks.

The tank contents have been removed and placed in compliant storage, as has the tank itself. The concrete vault was removed and disposed of at the RWMC along with the contaminated soil, which was removed to a level below the remediation goal of 23 pCi/g. No environmental risk was associated with this site. The tank contents that have been removed are identified as principal-threat waste and could pose an unacceptable risk if released to the environment. Therefore, the selected treatment alternative provides

highly effective, long-term protection of human health and the environment through the destruction of toxic organics in accordance with the regulatory requirements, as promulgated through the ARARs presented in the ROD (DOE-ID 2000).

PCBs will be managed in accordance with EDF-3077, "Risk-Based Approach for Management of PCB Remediation Waste from the V-Tanks," which was approved as part of the OU 1-10 ESD (DOE-ID 2004a). Signature by EPA of that OU 1-10 ESD confirms the EPA finding of no unreasonable risk of injury to health or the environment under 40 CFR 761.61(c).

To mitigate the risks associated with the radiological component of the waste, the final treated waste form will be solidified/stabilized, which will serve to both encapsulate and provide additional shielding from the gamma-emitting isotopes that contribute to external dose exposure.

3.2 Compliance with Applicable or Relevant and Appropriate Requirements

The proposed treatment alternative ensures that the ARARs promulgated in the ROD (DOE-ID 2000) are met in compliance with federal environmental laws and state environmental or facility siting laws. As provided in the ROD (DOE-ID 2000), the substantive ARARs in RCRA (42 USC § 6901 et seq.) and the Idaho Administrative Procedures Act will be met. Rather than meeting the PCB remediation waste performance-based disposal ARAR (40 CFR 761.61[b][1]), as specified in the ROD (DOE-ID 2000), PCBs will be managed in accordance with the requirements of an approved risk-based management approach, as delineated in 40 CFR 761.61(c), ensuring that the waste does not pose an unreasonable risk of injury to human health and the environment. With the waste being treated at the INEEL site, the substantive requirements of the ARARs for control of off-gases will be met through the use of engineering controls. The ARARs established in the ROD amendment (DOE-ID 2004c) will be followed once the waste streams are combined.

3.3 Cost

Costs incurred by WAG 5 will primarily be for the following activities associated with treatment of the ARA-16 radionuclide tank contents: (1) the transportation of the waste from ARA-I, where the waste is currently stored, to Test Area North, where the V-Tanks treatment system will be fabricated; (2) design and fabrication of the system for transferring the ARA-16 waste from the high-integrity container into the V-Tanks treatment system and rinsing the high-integrity container after the transfer; and (3) the actual transfer and rinsing activities and grouting the high-integrity container for transport to and disposal at the ICDF. These costs are estimated to be $118K. Once the waste has been transferred to the V-Tanks treatment system, the WAG 1 project will assume responsibility for treatment of the waste, stabilization of the treatment residual, and final disposal of the stabilized residue at the ICDF. Given the relatively small volume of the ARA-16 waste stream (80 gal of sludge plus a maximum of 300 gal of rinsate) in comparison to the V-Tanks waste stream (11,910 gal plus rinsates), the contribution of the ARA-16 waste to the overall cost for treating the combined waste streams will be minimal.

The ROD (DOE-ID 2000) did not specifically break out treatment and disposal costs for the ARA-16 tank contents, nor did the *Waste Area Group 5 Operable Unit 5-12 Comprehensive Remedial Investigation/Feasibility Study* (DOE-ID 1999); however, the remedial investigation/feasibility study (DOE-ID 1999) did provide a cost analysis of the alternatives, with limited detail as to the costs associated with the transport of the ARA-16 waste. These costs included preparation of required transportation documentation ($48K) and transport cask rental allowance ($45K). After the ROD (DOE-ID 2000) and remedial investigation/feasibility study (DOE-ID 1999) were completed, cost

estimates were obtained for off-Site treatment and disposal ranging from $250K to $500K. The high costs for treatment and disposal were attributed to the complexity of the waste stream and handling requirements attributed to the radiological dose from the waste.

4. PUBLIC PARTICIPATION ACTIVITIES

This ESD will become part of the administrative record for the WAG 5 OU 5-12 site. A notice of availability and a description of this ESD will be published in the *Post Register* (Idaho Falls), *Idaho State Journal* (Pocatello), *Sho-Ban News* (Fort Hall), *Times News* (Twin Falls), *Idaho Statesman* (Boise), and *Daily News* (Moscow). As modified from the original ROD, this action does not represent a fundamental change in scope or purpose; therefore, a formal comment period will not be implemented. For additional information regarding this ESD, contact the INEEL Community Relations Office at (208) 526-4700 or 1-800-708-2680.

5. REFERENCES

40 CFR 300, 2004, "National Oil and Hazardous Substances Pollution Contingency Plan," *Code of Federal Regulations*, Office of Federal Register, August 2004.

40 CFR 300.435, 2004, "Remedial Design/Remedial Action, Operation and Maintenance," *Code of Federal Regulations*, Office of Federal Register, August 2004.

40 CFR 761.61, 2003, "PCB Remediation Waste," *Code of Federal Regulations*, Office of Federal Register, June 2003.

55 FR 8690, 1990, "National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule," *Federal Register*, March 6, 1990.

15 USC § 2601 et seq., 1976, "The Toxic Substances Control Act (TSCA) of 1976," *United States Code.*

42 USC § 6901 et seq., 1976, "Resource Conservation and Recovery Act (Solid Waste Disposal Act)," *United States Code*, October 21, 1976.

42 USC § 9601 et seq., 1980, "Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA/Superfund)," *United States Code,* December 11, 1980.

DOE-ID, 1999, *Waste Area Group 5 Operable Unit 5-12 Comprehensive Remedial Investigation/Feasibility Study*, DOE/ID-10607, Rev. 0, U.S. Department of Energy Idaho Operations Office, January 1999.

DOE-ID, 2000, *Record of Decision Power Burst Facility and Auxiliary Reactor Area,* DOE/ID-10700, Rev. 0, U.S. Department of Energy Idaho Operations Office, January 2000.

DOE-ID, 2004a, *Explanation of Significant Differences for the Record of Decision for the Test Area North Operable Unit 1-10*, DOE/NE-ID-11199, Rev. 0, U.S. Department of Energy, Idaho Operations Office, December 2004.

DOE-ID, 2004b, *Group 2 Remedial Design/Remedial Action Work Plan Addendum 2 for the TSF-09/18 V-Tanks and Contents Removal, Phase 1 Contents Treatment, and Site Remediation at Test Area North, Waste Area Group 1, Operable Unit 1-10*, DOE/NE-ID-11150, Rev. 1, U.S. Department of Energy Idaho Operations Office, November 2004.

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EDF-3077, 2004, "Risk-Based Approach for Management of PCB Remediation Waste from V-Tanks," Rev. 1, December 2004.